

Remarks

Claims 1-33 are currently pending and stand rejected. Claims 32 and 33 have been cancelled without prejudice or disclaimer. Reconsideration of the above-identified application in view of these remarks is respectfully requested.

I. Rejection of Claims 1-33 under 35 U.S.C. §102(e)

In the Office Action mailed March 27, 2007 (hereinafter: "the non-final Office Action"), claims 1-33 were rejected as anticipated under 35 U.S.C. §102(e) by U.S. Patent Publication No. 2004/0240706 to Wallace et al. (hereinafter, "Wallace"). Enclosed are two declarations under 37 C.F.R. §1.132 from the four inventors of the Wallace system, specifically Yun Luo, Robert Dziadula, Farid Khairallah, and Jon Wallace, stating that the subject matter in Wallace that would be encompassed by claims 1-31 of the subject applicant was invented by the inventors of the subject application, specifically Yun Luo, Farid Khairallah, and Jon Wallace. Since what was disclosed in the Wallace et al. publication had to necessarily be published after it was invented by Luo, Khairallah and Wallace, the '706 publication is not prior art under 35 U.S.C. §102(e). It is respectfully requested that the rejection of claims 1-31 for this reason must be withdrawn.

III. Rejections of Claims 1-5, 11, 12, and 17-19 under 35 U.S.C. §103(a)

Claims 1-5, 11, 12, and 17-19 have been rejected as unpatentable over U.S. Patent No. 6,801,662 to Owechko et al. (hereinafter: "Owechko"), in view of U.S. Patent Publication No. 2004/0153229 to Gokturk et al. (hereinafter, "Gokturk"). It is respectfully submitted that claims 1-5, 11, 12, and 17-19 define over the cited art.

In response to the non-final Office Action, applicants argued that Owechko and Gokturk, taken alone or in combination, fail to teach or suggest a candidate matcher that predicts the current position of a prior head candidate and selects head candidates according to their distance from the predicted location. In response, the Final Office Action states that the template matching scheme of Gorturk that "determines the location of the head in the current frame given the location and shape in the previous frame" Gorturk ¶0151. Applicants do not contest that Gorturk limits the search for head candidates in a new frame to an area around the previous location of the head candidate is searched for a new head candidate. It is respectfully submitted, however, that Gorturk, at best, fairly suggests to one of skill in the art the use of the previous position as a starting point for a new search. There is no teaching or suggestion of predicting a candidate location "from the previous position and motion of the head" as recited in claims 1 and 19.

Further, since Gorturk does not identify head candidates outside of this limited search space, one skilled in the art would not be lead to the claimed selection of head candidates according to their distance from the predicted position. In Gorturk, all head candidates within the search space are evaluated. Accordingly, there is no existing plurality of identified head candidates from which to select a subset as recited in claim 1. To the extent that the evaluation of the heads within the search space is read as a selection, there is no teaching of evaluating the selected subset.

The Examiner cites a depth-based algorithm of Gorturk in which the pixels are grouped into elliptical head candidates according to their associated depth values as a teaching of selecting head candidates according to their distance from the previous

head location. It is respectfully submitted that the depth-based algorithm is, as the cited text would indicate, merely a grouping of pixels at similar depths that fit an ellipse model. There is nothing in Gorturk to suggest that this process has anything to do with the position of any previous head candidates, and thus does not represent selecting a subset of the at least one of the plurality of possible new head candidates according to their distance from the projected head candidate_position. Further, it is respectfully submitted that if elliptical groups of pixels are still being located at the point in the process cited by the Examiner, the process can not represent a selection of head candidates as no head candidates have been identified. It is thus respectfully submitted that Gorturk does not teach or suggest a candidate matcher that predicts the current position of a prior head candidate and selects head candidates according to their distance from the predicted location. Nothing in Owechko, taken alone or in combination with Gorturh, remedies this deficiency. It is thus respectfully submitted that Gorturk in view of Owechko does not teach or suggest all of the limitations of claim 1.

Applicants further argued that one skilled in the art would have no reason to modify Owechko in view of Gorturk in the manner described in the Final Office Action. The Examiner responded that one of skill in the art would be motivated to modify Owechko in view of Gorturk to provide the claimed system as it would allow for head tracking in Owechko. It is respectfully submitted, however, that the proposed motivation can be achieved without modifying the head tracking algorithm taught in Gokturk. Gokturk teaches identifying head candidates solely in the region the previous candidate to save processing resources. There would be no reason for

one skilled in the art, in modifying Owechko to introduce the head tracking function of Gokturk, to produce a system that recognizes head candidates throughout the entire image and selects those around the previous image absent the teachings of the subject application. In fact, such a modification represents a waste of processing resources relative to a simple incorporation of the existing head tracking system of Gokturk into Owechko. It is thus respectfully submitted that claim 1 defines over the cited art, and it is respectfully requested that the rejection of claim 1 be withdrawn.

Each of claims 2-5, 11, 12, 17, and 18 depend, directly or indirectly, from claim 1, and are allowable for at least the same reasons. It is thus submitted that each of claims 1-5, 11, 12, 17, and 18 define over the cited art, and the withdrawal of the rejection of these claims is respectfully requested. Claim 19 contains similar subject matter to claim 1 and is allowable for at least the reasons given above. It is thus respectfully submitted that claim 19 defines over the cited art, and the withdrawal of the rejection of claim 19 is respectfully requested.

IV. Rejection of Claims 6-10 under 35 U.S.C. §103(a)

Claims 6-10 have been rejected as unpatentable over Owechko and Gokturk in further view of U.S. Patent Publication No. 2003/0235341 to Gokturk et al. (hereinafter, "Gokturk03"). It is respectfully submitted that claims 6-10 define over the cited art.

The Examiner mischaracterizes Applicants argument, stating that Applicants have argued that claims 6-10 are patentable because Gokturk03 fails to teach all of the limitations of claim 1. Applicants respectfully submit, as before, that Gokturk in view of Owechko fails to teach or suggest all of the limitations of claim 1, and that

Gokturk03 does not remedy these deficiencies. The Examiner has not demonstrated otherwise, relying on Gokturk in view of Owechko in rejecting claim 1. Claims 6-10 depend, directly or indirectly, from claim 1 and are allowable for at least the reasons given for the allowance of claim 1. It is thus submitted that claims 6-10 define over the cited art.

Further, the Examiner has shifted position on claim 8 to state that Gokturk03 teaches most of the claim limitations while Owechko teaches "the concept of confidence value assignment." Claim 8 recites that a confidence value associated with the given tracked candidate is updated according to the position of the selected subset of the identified at least one of a plurality of possible head candidates relative to the at least one threshold distance and the evaluated similarity of identified at least one of a plurality of possible head candidates to the tracked candidate. The Examiner fails to explain how one of skill in the art takes a general teaching of "the concept of confidence value assignment" and the head search within a defined radius in Gokturk03 and reaches the specific method of assigning a confidence value that is recited in claim 8. The proposed motivation is that assigning a confidence value would increase the accuracy and efficiency of the search process because the search space is limited to the region around the detected head is generic to any methodology for determining a confidence value, and does not explain how one skilled in the art would be led to the recited methodology for updating the confidence value. In fact, given the limited search space of Gokturk03, a location based confidence value might be less valuable in preserving the "accuracy and efficiency" of the system, as the distances at which the confidence values might be most

discriminatory are eliminated prior to the search. It is thus respectfully submitted, that claim 8 defines over the cited art.

V. Rejection of Claim 13 under 35 U.S.C. §103(a)

Claim 13 has been rejected as unpatentable over Owechko, Gokturk, and Gokturk03 in further view of U.S. Patent 5,973,732 to Guthrie. (hereinafter, "Guthrie"). Claim 13 depends indirectly from claim 1 and is allowable for at least the same reasons. Guthrie does not remedy the deficiencies of Owechko, Gokturk, and Gokturk03 as applied to claim 1. It is respectfully submitted that claim 13 defines over the cited art, and the withdrawal of the rejection of claim 13 is respectfully requested.

VI. Rejection of Claims 14-16 under 35 U.S.C. §103(a)

Claims 14-16 have been rejected as unpatentable over Owechko, Gokturk, Gokturk03, and Guthrie in further view of U.S. Patent 7,134,688 to Takagi et al. (hereinafter, "Takagi"). Each of claims 14-16 depends indirectly from claim 1 and is allowable for at least the same reasons. Takagi does not remedy the deficiencies of Owechko, Gokturk, Guthrie, and Gokturk03 as applied to claim 1. It is respectfully submitted that claims 14-16 define over the cited art, and the withdrawal of the rejection of claims 14-16 is respectfully requested.

VII. Rejection of Claims 20-30, 32 and 33 under 35 U.S.C. §103(a)

Claims 20-30 have been rejected as unpatentable over Owechko and Gokturk in further view of Gokturk03. It is respectfully submitted that claims 20-30 define over the cited art.

Claims 20 and 30 recite similar subject matter to claim 1, but include the additional element that the current location of the previous head candidate is predicted according to its previous location and motion. The cited art, specifically Gokturk and Gokturk03, search for new head candidates around the previous location of the head. There is no teaching or suggesting of taking into account the previous motion of the head whatsoever in searching for the new head candidate. Accordingly, claims 20 and 30 define over the cited art for at least the reasons described with respect to claim 1 as well as the reasons described above.

Claim 27 recites an inner threshold distance and an outer threshold distance around the predicted location, where a confidence value associated with a selected new head candidate is compared to a threshold value only if the selected new head candidate falls between the inner threshold distance and the outer threshold distance. The Examiner claimed to find this teaching in Gorturk03, but Applicants pointed out in the previous action that Gorturk03 did not provide this teaching. The Examiner responds by stating that Applicants are attacking the references individually, but provides no other support for a teaching or suggestion of comparing a confidence value associated with a selected new head candidate to a threshold value only if the selected new head candidate falls between the inner threshold distance and the outer threshold distance. In the absence of a demonstrated teaching or suggestion of the recited limitation, it is respectfully submitted that claim 27 is allowable over the cited art.

Each of claims 21-29 depend, directly or indirectly, from one of claims 20 and 30 and are allowable for at least the same reasons. It is thus submitted that

claims 20-30 define over the cited art, and the withdrawal of this rejection is respectfully requested.

VIII. Rejection of Claim 31 under 35 U.S.C. §103(a)

Claim 31 has been rejected as unpatentable over Owechko, Gokturk, and Gokturk03 in further view of Guthrie. Claim 30 depends from claim 30 and is allowable for at least the reasons given in the discussion of claim 30. Guthrie does not remedy the various deficiencies of Owechko, Gokturk, and Gokturk03 as applied to claim 30. It is thus submitted that claim 31 defines over the cited art, and the withdrawal of this rejection is respectfully requested.

IX. Conclusion

It is respectfully submitted that claims 1-31 define over the cited art. The withdrawal of the rejections of these claims and the passage of the application to issue is respectfully requested.

Please charge any deficiency or credit any overpayment in the fees for this matter to our Deposit Account No. 20-0090.

Respectfully submitted,

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